

WHAT IS CLAIMED IS

1. A vector search method in which a difference error between a prediction vector and an input vector is calculated in such a way that combinations of factors respectively multiplied by a plurality of basic vectors are changed according to the Gray code.

2. A vector search method as claimed in Claim 1, wherein an intermediate value  $G_u$  obtained by calculation of a synthetic vector created according to a sign word  $u$  of the Gray code is expressed by an intermediate value  $G_i$  obtained by a calculation of a synthetic vector created according to an adjacent sign word  $i$  different from said sign word  $u$  only in a predetermined bit position  $v$  and a change  $\Delta G_u$  calculated by utilizing the Gray code characteristic, and

said  $\Delta G_u$  is used to express a change  $\Delta G_{u'}$  between an intermediate value  $G_{i'}$  according to another sign word  $i'$  in said Gray code and an intermediate value  $G_{u'}$  according to an adjacent sign word  $u'$  different from said sign word  $i'$  only in a predetermined bit position  $v$ .

3. A vector search method as claimed in Claim 2, wherein said prediction vector is created through a prediction synthesis filter by synthesizing said synthetic vector and a vector based on a past sound source signal.

4. A vector search method as claimed in Claim 2, wherein

said sign word  $u'$  in said Gray code differs from said sign word  $u$  only in one bit position  $w$  excluding the predetermined bit position  $v$ , and

said change  $\Delta Gu'$  is expressed as a sum of said change  $\Delta Gu$  already obtained according to said sign word  $u$  of said Gray code and a difference between said change  $\Delta Gu$  and said  $\Delta Gu'$ .

5. A vector search method as claimed in Claim 2, wherein the calculation to minimize the difference between said prediction vector and said input vector is a calculation to determine such a synthetic vector from synthetic vectors created by synthesizing basic vectors for the sign word  $i$  of the Gray code that makes maximum an inner product with said input vector, and

said inner product is expressed, by using two variables  $C_i$  and  $G_i$ , as  $C_i^2/G_i$ , whose value is made maximum.

6. A vector search method as claimed in Claim 2, wherein the calculation to minimize the difference between said prediction vector and said input vector is a calculation to determine such synthetic vector from synthetic vectors created by synthesizing basic vectors for the sign word  $i$  of the Gray code that makes minimum an Euclid distance from said input vector, and

said Euclid distance is expressed by a sum of two variables  $C_i$  and  $G_i$ , which sum is minimized.